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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/522,051

Applicant(s)

IMELAINEN, KEIJO

Examiner

Anna Kinney

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/20/05 & 5/3/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitations "the waste liquor", "the cellulose pulp digestion liquor", "the recovery boiler", "the thermal energy", and "the flue gases" in lines 2-4 of the claim. There is insufficient antecedent basis for these limitations in the claim.

Claim 1 recites "production of thermal and electric energy" in lines 1-2 of the claim, and also recites conversion of thermal energy to electric energy as an optional step in lines 5-6 of the claim. Similarly, claim 9 recites "thermal or electric energy" in line 1 of the claim, and recites "heat and electricity" in line 9 of the claim. The Examiner cannot determine the metes and bounds of patent protection desired by the applicant. For purposes of examination, the Examiner has construed the production of electric energy to be optional.

Claim 4 recites the limitations "the soda recovery boiler steam" and "the soda recovery boiler" in lines 3 and 4 of the claim. There is insufficient antecedent basis for these limitations in the claim.

Claim 4 is indefinite in that the claim appears to suggest that (all) the fuel gas is combusted separately from the waste liquor in the recovery boiler. However, claim 4 is

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dependent from claim 1, which appears to require that the fuel gas and the waste liquor are combusted together in the recovery boiler. The Examiner cannot determine which embodiment is intended.

Claim 8 recites the limitation "the solid fuel" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claims 8, 13, and 15 are indefinite in that the claim does not clearly recite a pressure range. The symbol "..." could be interpreted to mean "to" or "or" or to represent a series of values between the recited values.

Claim 9 recites the limitations "the wood material", "the cooking liquor", "the fibers", "the digested wood material", "the fiber material", "the soda recovery boiler", "the cooking chemicals", "the solid biogenic fuel", "the formed ash" in lines 3-13 of the claim. There is insufficient antecedent basis for these limitations in the claim.

Claim 11 recites the limitation "the forest" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitations "the flue gas" and "the combustion chamber" in line 3 of the claims. There is insufficient antecedent basis for these limitations in the claim.

Regarding claim 16, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 17 recites the limitations "the combustion chamber" and "the boiler water" in lines 2 and 7 of the claim. There is insufficient antecedent basis for these limitations in the claim.

Claim 18 recites the limitation "the lime sludge reburning kiln" in lines 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitations "the recovery boiler" and "the feed unit" in lines 2-3 of the claim. There is insufficient antecedent basis for these limitations in the claim.

Claim 23 recites the limitation "at least one of the dryers" in the last line of the claim. There is insufficient antecedent basis for this limitation in the claim. Only one drying unit is recited in independent claim 19.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19-20, 23, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cardin et al (US 2003/0127030 A1) in view of Saviharju et al (US 2004/0011484 A1), and Berg (US 5,103,743).

With respect to claim 19, Cardin discloses a draft airflow furnace that provides chemical recovery (Abstract) and steam generation (Fig. 1, item 40), which the Examiner construes to be a recovery boiler of a pulp mill, with a feed unit to feed into

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the furnace fuel oil, natural gas, or other more easily ignited material (i.e., a fuel gas; Fig. 1, item CSF and pg. 3, col. 1, ¶ 0024).

Cardin does not disclose expressly an apparatus producing the fuel gas.

Saviharju discloses an apparatus for producing, from wood bark, a biogenic fuel gas to be fed into an apparatus connected to a recovery boiler, comprising a dried-bark gasifier (Fig. 1, item 10) for producing fuel gas from the bark, the apparatus having feed means for bark (Fig. 1, item 12) and outlet means for fuel gas (Fig. 1, item 44).

Saviharju discloses bark drying, and incorporates Berg by reference to disclose a bark-drying unit.

Berg discloses as a combination a bark-drying unit (Fig. 1, item 17) having feed means for the bark to be dried (Fig. 1, items 12 and 16) and outlet means for the bark that has been dried (Fig. 1, item 20), a feed means (Fig. 1, item 26) of a gasifier (Fig. 1, item 4) connected to the outlet means of the drying unit (Fig. 1, items 24 and 23), and a gas outlet means (Fig. 1, item 3).

Cardin, Saviharju, and Berg do not disclose expressly that the gas outlet means is connected to the feed unit of the recovery.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine a bark drying and gasification apparatus with a gas outlet means as described by Saviharju and Berg with the feed unit of the recovery furnace of Cardin to obtain the invention as specified in claim 19.

The motivation would have been to provide an easily ignited material to assist in initial ignition and burning consistency (Cardin, pg. 3, col. 1, ¶ 0024), that atmospheric

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gasification of wood and bark in fluidized bed gasifiers has been in commercial use since 1983 in pulp mills for producing combustible gas (Saviharju, pg. 1, col. 2, ¶ 0007), that when using bark or other wood wastes as a source of heat no carbon dioxide emissions are generated, contrary to situations in which fossil fuels, such as natural gas or heavy fuel oil, are used (Saviharju, pg. 2, col. 1, ¶ 0016), and that gases generated from dry wood contain more combustible components than do gases produced from damp wood (Saviharju, pg. 2, col. 2, ¶ 0020).

With respect to claim 20, Berg discloses that the location and length of the dryer is dependent on the circumstances (col. 4, lines 53-58).

Although Cardin, Saviharju, and Berg do not disclose expressly two separate dryers, duplication of parts has no patentable significance unless a new and unexpected result is produced (see MPEP 2144.04 VI B).

With respect to claim 23, Saviharju and Berg are applied as in the rejection to claim 14, above.

With respect to claim 27, Saviharju discloses that the outlet means of the gasifier is connected to a gas purification unit (Fig. 1, item 42) to separate impurities from the fuel gas before it is fed into the boiler.

Claims 1-5, 9-14, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cardin et al (US 2003/0127030 A1) in view of Saviharju et al (US 2004/0011484 A1), Berg (US 5,103,743), and Ulrich (US 5,678,494).

With respect to claim 1, Cardin discloses a process for the production of thermal energy in a pulp mill (pg. 2, col. 2, ¶ 0020), according to which process the waste liquor

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of the cellulose pulp digestion liquor is concentrated, and this concentrated liquor is burned in the recovery boiler (pg. 2, col. 1, ¶ 0013 and pg. 1, col. 1, ¶ 0004) in the presence of fuels (pg. 3, col. 1, ¶ 0024), the thermal energy of the flue gases obtained from the burning being recovered (pg. 2, col. 2, ¶ 0020).

Cardin does not disclose expressly that electric energy is produced, or that the fuel added to the liquor is a biogenic fuel produced by drying and gasifying wood waste. However, Cardin does disclose that the fuel can be natural gas or other more easily ignited material. Natural gas is primarily composed of methane. Synthesis gas, or fuel gas, is primarily composed of carbon monoxide and hydrogen. Hydrogen is a very easily ignited material. The Examiner has construed the production of electric energy to be optional. However, Cardin discloses the production of steam (pg. 3, col. 1, ¶ 0027). It is well known in the art to use steam to produce electric energy.

Saviharju discloses a method of producing energy at a pulp mill (pg. 1, col. 2, ¶ 0009) comprising drying wood waste such as bark (pg. 2, col. 2, ¶ 0020), gasifying the wood waste (pg. 2, col. 2, ¶ 0021) to produce a biogenic fuel gas, and combusting the biogenic fuel gas to produce thermal energy (pg. 1, ¶ 0008). Saviharju incorporates Berg by reference (pg. 2, col. 2, ¶ 0020).

Berg discloses a method for drying solid material, especially wood waste such as bark (Title and col. 2, lines 47-49), which is subsequently gasified (col. 4, lines 5-7).

Saviharju and Berg do not disclose expressly the moisture content of the dried wood waste. However, Berg discloses that the drying result (which the Examiner

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construes to mean moisture content) is affected by the retention time in the dryer (col. 4, lines 23-28).

Ulrich discloses a method of gasifying and subsequently combusting biomass fuel, such as wood chips (col. 4, line 57 – col. 6, line 5) which have been dried to a moisture content of 30% or less (col. 6, lines 21-26), which contains one specific endpoint of the claimed range of below 30%.

At the time of the invention, absent a showing of unexpected results, it would have been obvious to a person of ordinary skill in the art to optimize the moisture content of the dried wood waste to achieve desired flame temperatures (col. 6, lines 21-26). Furthermore, the wide range claimed indicates a lack of criticality. It has been held that discovering the optimum or workable ranges or an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05 II.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to dry and gasify wood waste to produce a fuel gas as described by Saviharju and Berg, with a moisture content as described by Ulrich, to be used in the recovery process of Cardin, to obtain the invention as specified in claim 1.

The motivation would have been to provide an easily ignited material to assist in initial ignition and burning consistency (Cardin, pg. 3, col. 1, ¶ 0024), that atmospheric gasification of wood and bark in fluidized bed gasifiers has been in commercial use since 1983 in pulp mills for producing combustible gas (Saviharju, pg. 1, col. 2, ¶ 0007), that when using bark or other wood wastes as a source of heat no carbon dioxide emissions are generated, contrary to situations in which fossil fuels, such as natural gas

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or heavy fuel oil, are used (Saviharju, pg. 2, col. 1, ¶ 0016), that gases generated from dry wood contain more combustible components than do gases produced from damp wood (Saviharju, pg. 2, col. 2, ¶ 0020), and that drying to 30% or less moisture is feasible and practical (Ulrich, col. 6, lines 25-26).

With respect to claim 2, Cardin Saviharju, Berg, and Ulrich are applied as in the rejection to claim 1, above. The range 30% or less encompasses the claimed range of below 20%. At the time of the invention, absent a showing of unexpected results, it would have been obvious to a person of ordinary skill in the art to optimize the fraction of fuel gas fed to the recovery boiler to achieve a stable burn condition, depending on the quality of the black liquor and other process conditions (Cardin, pg. 3, col. 1, ¶ 0024). Furthermore, the wide range claimed indicates a lack of criticality. It has been held that discovering the optimum or workable ranges or an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05 II.

With respect to claim 3, Saviharju discloses purification of flue gas from the gasifier to remove alkali components (which the Examiner construes as ash; pg. 3, col. 1, ¶ 0023). Berg discloses that ashes and soot are separated from hot product gas, whereby impurities are prevented from entering chemical circulation (col. 4, lines 7-10). Ulrich discloses that ash produced in the primary combustor enters openings in the surface (col. 4, lines 27-29) and is collected (col. 8, line 46).

With respect to claim 4, Cardin discloses that the recovery furnace combusts a spent sodium hydroxide and/or soda ash liquor (pg. 1, col. 2 – pg. 2, col. 1, ¶ 0013). Saviharju discloses that the heat produced using the fuel gas is used for superheating

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the recovery boiler steam in a superheating boiler (i.e., chamber; Abstract) separate from the flue gases of the soda recovery boiler (Fig. 1, items 18, 44, 38).

With respect to claim 5, Saviharju et al discloses that the waste wood is bark waste or other wood wastes (pg. 1, col. 2, ¶ 0009). Berg discloses that the waste wood is bark waste, sawdust, wood waste, or other biowaste (col. 2, lines 47-49).

With respect to claim 9, Cardin, Saviharju, Berg, and Ulrich are applied as in the rejections to claims 1 and 3, above. Saviharju discloses a kraft (i.e., sulfate) pulp mill (pg. 1, col. 2, ¶ 0009, lines 3-4). Cardin discloses that the wood material used for pulp production is in part digested in the cooking liquor to separate the fibers from each other, the digested wood material is extracted as black liquor from the fiber material, the black liquor is concentrated by evaporation, and the cooking chemicals are regenerated (pg. 1, col. 1, ¶s 0003-0005).

With respect to claims 10-11, Cardin, Saviharju, Berg, and Ulrich are applied as in the rejection to claim 5.

With respect to claim 12, Berg discloses drying and gasifying peat (Abstract, lines 1-3 and col. 4, lines 5-7).

With respect to claim 13, Cardin, Saviharju, Berg, and Ulrich are applied as in the rejections to claims 1 and 2.

With respect to claim 14, Saviharju discloses that the wood material (i.e., the solid fuel) may be dried by the flue gases from the recovery boiler (i.e., the combustion chamber; pg. 2, col. 2, ¶ 0020). Saviharju further discloses heat recovery in the recovery boiler (pg. 2, col. 1, ¶ 0013).

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Berg discloses bringing flue gas into direct contact with solid fuel to be dried (col. 2, lines 40-49).

With respect to claim 16, the Examiner construes the flue gases used as energy to dry fuel as disclosed in Saviharju and Berg to be surplus heat that is present at the pulp mill.

With respect to claim 17, Saviharju is applied as in the rejection to claims 1 and 4, above. Saviharju further discloses that, the heat released from combusting black liquor is used to generate steam (i.e., for the vaporization of the boiler water; pg. 2, col. 1, ¶ 0013).

With respect to claim 18, Berg discloses a portion of the solid biogenic fuel that has been brought into a gaseous form is, after the separation of ash, burned in the lime sludge reburning kiln (col. 2, lines 47-49, col. 3, lines 3-7, col. 4, lines 7-10, and col. 5, lines 1-11).

Claims 6-8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cardin, Saviharju, Berg, and Ulrich, as applied to claim 1 above, and further in view of O'Hagan et al (US 4,627,173).

With respect to claims 6 and 7, Cardin, Saviharju, Berg, and Ulrich do not disclose expressly that the drying gases have a temperature below 200°C.

O'Hagan discloses a method of drying hog fuel (i.e., wood waste) using flue gases typically having a temperature of 400-600°F (converts to 204-315°C; col. 6, lines 34-50), and further discloses that the flue gases are cooled in the dryer to 160-250°F (converts to 71-121°C), which contains 2 specific points within the claimed ranges of

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below 200°C for claim 6, and of below 180°C for claim 7. At the time of the invention, absent a showing of unexpected results, it would have been obvious to a person of ordinary skill in the art to optimize the temperature of the drying gases to achieve a 10-30% moisture content without overdrying fine particles and to eliminate a “blue haze” air pollution problem (col. 5, lines 59-61, col. 2, lines 36-42, and col. 4, lines 56-60)). Furthermore, the wide range claimed indicates a lack of criticality. It has been held that discovering the optimum or workable ranges or an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05 II.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use drying gas temperatures as described by O'Hagan et al in the wood waste drying step of Cardin, Saviharju, Berg, and Ulrich to obtain the invention as specified in claim 6.

The motivation would have been that hog fuel dryers are well known in the forest products industry (col. 1, lines 55-56), and that many heated gases are suitable for fluidizing and drying, providing they have sufficient heat content to accomplish the drying at reasonable flow rates (col. 5, line 67 – col. 6, line 3).

With respect to claim 8, Cardin, Saviharju, Berg, and Ulrich do not disclose expressly that steam is used to provide drying energy.

O'Hagan discloses that a few hog fuel dryers use steam (col. 1, lines 55-59). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use steam in a form readily available onsite. Cardin discloses steam used in the process at a pressure of 10-30 psig (converts to 0.7-2.1 bar; pg. 3, col. 2, ¶ 0037, lines

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2-3), which contains 2 specific points within the claimed range of 0.1 . . . 100 bar (which the Examiner construes to mean 0.1 to 100 bar).

With respect to claim 15, O'Hagan is applied as in the rejection to claim 8, above.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cardin, Saviharju, and Berg as applied to claim 20 above, and further in view of O'Hagan.

With respect to claims 24 and 25, O'Hagan discloses that the dryer is a fluid-bed dryer (Fig. 1, item 7 and col. 7, lines 13-15).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to select a fluid bed dryer as described by O'Hagan as the drying apparatus in the bark drying and gasification apparatus of Cardin, Saviharju, and Berg, to obtain the invention as specified in claim 24.

The motivation would have been that fluid or fluidized bed dryers are well known for the high rate of heat transfer between the gas and the fluidized particles as well as between bed particulates and surfaces immersed in the bed (col. 3, lines 18-21).

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cardin, Saviharju, and Berg as applied to claim 20 above, and further in view of Eneroth et al (US 4,229,183).

With respect to claims 21 and 22, Cardin, Saviharju, and Berg do not disclose expressly two dryers or a grinder.

Eneroth discloses a de-watering pretreatment of very moist bark (col. 3, lines 25-28), which the Examiner construes to be drying, a passageway (Fig. 2, item 6') which

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carries bark and flue gas for drying (i.e., a dryer; col. 2, line 64 – col. 3, line 31) to a mill where fuel is disintegrated (Fig. 2, item 10) to a powder state (i.e., a grinder pretreatment unit; col. 4, lines 53-55), and a passageway (Fig. 2, item 12) which serves as a pneumatic drying step (i.e., a dryer; col. 3, lines 14-16), prior to gasification (col. 4, lines 61-63). The mill (10) intrinsically has a feed unit connected to the outlet means of the first drier (6') and an outlet unit connected to the feed means of the second dryer (12).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use two driers and a mill as described by Eneroth in the drying and gasification apparatus of Cardin, Saviharju, and Berg to obtain the invention as specified in claim 21.

The motivation would have been that the material is disintegrated into a finely distributed state (col. 2, lines 32-35), that in certain cases the fuel suitably should be dried in several drying steps, where the fuel is passed to one or more additional pneumatic drying steps (col. 3, lines 35-38), and that the entire boiler can be designed with smaller dimensions (col. 2, lines 55-57).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cardin, Saviharju, and Berg as applied to claim 19 above, and further in view of Kurkela et al (WO 00/43468).

With respect to claim 26, Cardin, Saviharju, and Berg do not disclose expressly what type of gasifier is used.

Kurkel discloses a gasifier (Fig. 1, item 1) that is a fluid-bed boiler having an ebullating bed (Fig. 1, item 3), using fuels including peat and solid biofuels such as wood (pg. 4, lines 4-5).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a fluidized bed gasifier as described by Kurkela in the gasification apparatus of Cardin, Saviharju, and Berg to obtain the invention as specified in claim 26.

The motivation would have been that fuels can be gasified with a high carbon conversion, while the environmental problems due to the solid residue of the gasification process are decreased (Kurkela, pg. 2, lines 27-31).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2004/0128111 A1 shows that many recovery boilers use supplementary firing with gaseous fuel such as methane (which is produced in gasification). US 4,282,009 shows a rotating fluidized bed gasifier system. US 6,193,768 show drying and grinding of waste wood fuel. US 4,290,269 shows drying and grinding peat, bark, or sludge before combustion. US 6,357,144 shows a two stage process for drying of raw wood material.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Kinney whose telephone number is (571) 272-8388. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALK


ERIC HUG
PRIMARY EXAMINER